

**2009 KANSAS**  
**SEVERE WEATHER AWARENESS WEEK**  
MARCH 9-13, 2009

**TORNADO SAFETY DRILL TUESDAY, MARCH 10th**  
1:30 PM CDT

**INFORMATION PACKET**  
National Weather Service



# 2008 Kansas Tornado Facts

**Tornadoes: 187** (128 above the 1950-2008 average of 59)  
(114 above the past 30 year average of 73)  
(95 above the past 20 year average of 92)

**Deaths: 4      Injuries: 9**

**Longest Track:**

**55.2 miles** (Jewell Cty, KS to Jefferson Cty, NE – May 29)  
**21.9 miles** (Pratt Cty, KS ... longest entirely within Kansas)

**Strongest: EF4** (Gove Cty, May 23 ... Riley Cty, June 11)

**Most in a county: 12** (Gove, Sheridan, Trego)

**Days of occurrence: 25** (also called Tornado Days)

**Most in one day: 70** (May 23)

**Most in one month: 127** (May)

**Record Months: May** (127)

**First tornado of the year: March 2** (Sumner Cty, 5:05 pm CST)

**Last tornado of the year: November 10** (Stanton Cty, 3:26 pm CST)



May 22, 2008, Sheridan County in NW Kansas.  
Photo courtesy of Chris Foltz

## ----- 2008 Monthly Tornado Totals -----

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	
Total	0	0	1	4	127	39	7	0	7	1	1	0	187	100%
Percent	0%	0%	.5%	2%	68%	21%	4%	0%	4%	.5%	.5%	0%		
EF5	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
EF4	0	0	0	0	1	1	0	0	0	0	0	0	2	1%
EF3	0	0	0	0	7	2	0	0	0	0	0	0	9	5%
EF2	0	0	0	1	11	1	0	0	0	0	0	0	13	7%
EF1	0	0	0	0	31	6	0	0	1	0	0	0	38	20%
EF0	0	0	1	3	77	29	7	0	6	1	1	0	125	67%

Weak (EF0, EF1) tornadoes shaded green, strong (EF2, EF3) shaded yellow, violent (EF4, EF5) shaded red.

**Yearly Summary:** The 187 tornadoes reported in Kansas in 2008 set another new record. The previous record, set in 2007, was 141 tornadoes (a late correction added four tornadoes after last year's packet went to print). Interestingly, three of the past four years have set records for total number of tornadoes in the state. To put 2008 in perspective, the 187 tornadoes reported is just over three times the 1950-2008 average of 59. May was an especially active month with 127 tornadoes, a new record for any month in Kansas. The two day outbreak in late May (22<sup>nd</sup>-23<sup>rd</sup>) in western Kansas produced 87 of those tornadoes. Unfortunately, 4 fatalities and 9 injuries occurred in 2008. There were no EF5 tornadoes in the state, though two EF4 tornadoes occurred, one in western Kansas in Gove County on May 23<sup>rd</sup>, and the other in eastern Kansas in Riley County on June 11<sup>th</sup>.

# KANSAS TORNADO STATISTICS

## by County

### 1950 - 2008

#### TORNADOES, FATALITIES, AND INJURIES

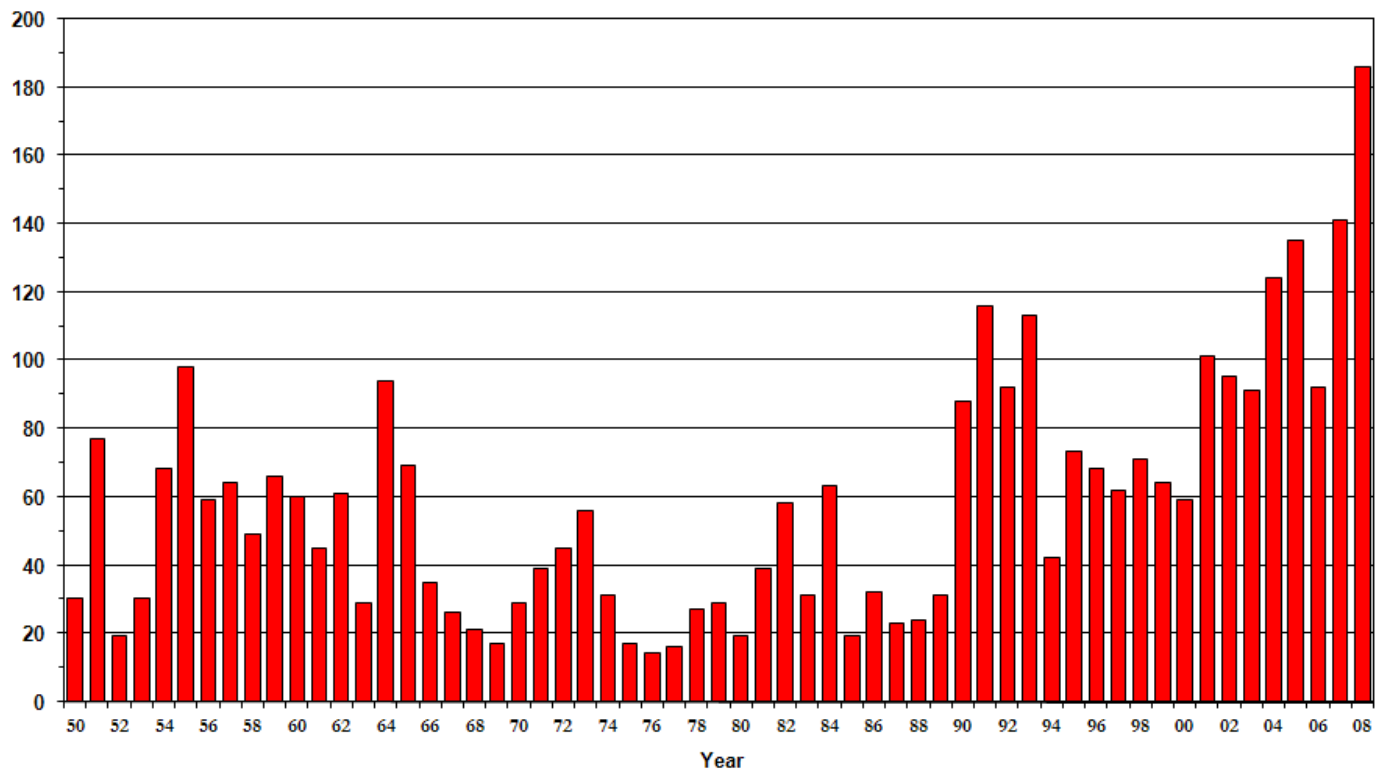
County	Tor	Fat	Inj	County	Tor	Fat	Inj	County	Tor	Fat	Inj
Allen	26	0	4	Greenwood	35	0	10	Pawnee	42	0	1
Anderson	14	3	12	Hamilton	21	0	1	Phillips	37	0	1
Atchison	15	0	11	Harper	55	0	1	Pottawatomie	31	0	5
Barber	31	0	2	Harvey	46	1	63	Pratt	65	3	10
Barton	84	2	37	Haskell	21	0	10	Rawlins	46	0	4
Bourbon	16	0	7	Hodgeman	42	0	4	Reno	68	0	20
Brown	42	0	5	Jackson	29	4	17	Republic	49	0	1
Butler	61	28	225	Jefferson	39	0	101	Rice	39	0	6
Chase	37	0	2	Jewell	33	0	1	Riley	27	0	51
Chautauqua	15	0	0	Johnson	35	4	12	Rooks	48	0	6
Cherokee	34	4	41	Kearny	30	0	0	Rush	33	0	8
Cheyenne	37	0	0	Kingman	44	0	1	Russell	63	1	7
Clark	37	0	0	Kiowa	49	11	74	Saline	30	0	66
Clay	36	1	31	Labette	33	1	29	Scott	36	1	1
Cloud	45	1	8	Lane	28	0	2	Sedgwick	76	13	321
Coffey	19	0	5	Leavenworth	29	2	30	Seward	32	0	15
Comanche	34	0	2	Lincoln	27	0	2	Shawnee	45	18	528
Cowley	51	77	291	Linn	13	0	3	Sheridan	32	0	0
Crawford	33	4	43	Logan	20	0	0	Sherman	93	0	0
Decatur	43	0	5	Lyon	40	6	217	Smith	40	0	1
Dickinson	34	1	12	McPherson	41	1	16	Stafford	61	1	4
Doniphan	17	0	2	Marion	43	1	2	Stanton	19	0	0
Douglas	37	1	48	Marshall	29	0	1	Stevens	24	1	5
Edwards	38	0	7	Meade	44	0	0	Sumner	72	5	14
Elk	23	2	8	Miami	18	0	9	Thomas	40	0	1
Ellis	51	0	6	Mitchell	46	0	5	Trego	57	5	101
Ellsworth	46	0	0	Montgomery	31	1	1	Wabaunsee	31	0	14
Finney	76	1	39	Morris	28	0	7	Wallace	35	0	4
Ford	73	0	0	Morton	18	1	2	Washington	32	2	12
Franklin	25	3	34	Nemaha	31	0	1	Wichita	23	3	4
Geary	17	0	3	Neosho	30	0	4	Wilson	15	0	0
Gove	36	0	3	Ness	40	0	4	Woodson	12	0	8
Graham	34	0	0	Norton	19	0	0	Wyandotte	10	2	36
Grant	24	0	9	Osage	37	17	6	<b>Total</b>	<b>3853</b>	<b>235</b>	<b>2818</b>
Gray	30	0	3	Osborne	40	0	13				
Greeley	30	0	0	Ottawa	24	2	9				

Cheyenne	Rawlins	Decatur 3	Norton	Phillips	Smith 1	Jewell 3	Republic 1	Washington 1	Marshall 1	Nemaha 1	Brown 1	Doniphan		
Sherman 2	Thomas	Sheridan 12	Graham 1	Rooks 8	Osborne 3	Mitchell 4	Cloud 2	Clay 3	Pottawatomie 2	Jackson 1	Achison 1	Jefferson 1	Leavenworth 1	Wyandotte 1
Wallace	Logan 2	Gove 12	Trego 12	Ellis 6	Russell	Lincoln	Ottawa	Dickenson 2	Riley 1	Shawnee 1	Douglas 3	Johnson 4		
Greeley 1	Wichita 2	Scott 1	Lane 10	Ness 7	Rush 5	Barton 10	Ellsworth 4	Saline 3	Geary 1	Wabaunsee 1	Osage 1	Franklin 1	Miami 1	
Hamilton 1	Kearny	Finney 2	Hodgeman 1	Pawnee	Stafford 6	Reno 2	Rice	McPherson 1	Chase 4	Lyon 1	Coffey 1	Anderson 1	Linn 1	
Stanton 1	Grant	Haskell 1	Gray 1	Ford 2	Edwards 5	Pratt 9	Kingman	Harvey 1	Butler	Greenwood 1	Woodson 2	Allen 2	Bourbon 1	
Morton	Stevens	Seward 1	Meade 1	Clark 8	Comanche 5	Barber 5	Harper	Sumner 1	Cowley 1	Elk 1	Wilson 2	Neosho 2	Crawford 1	

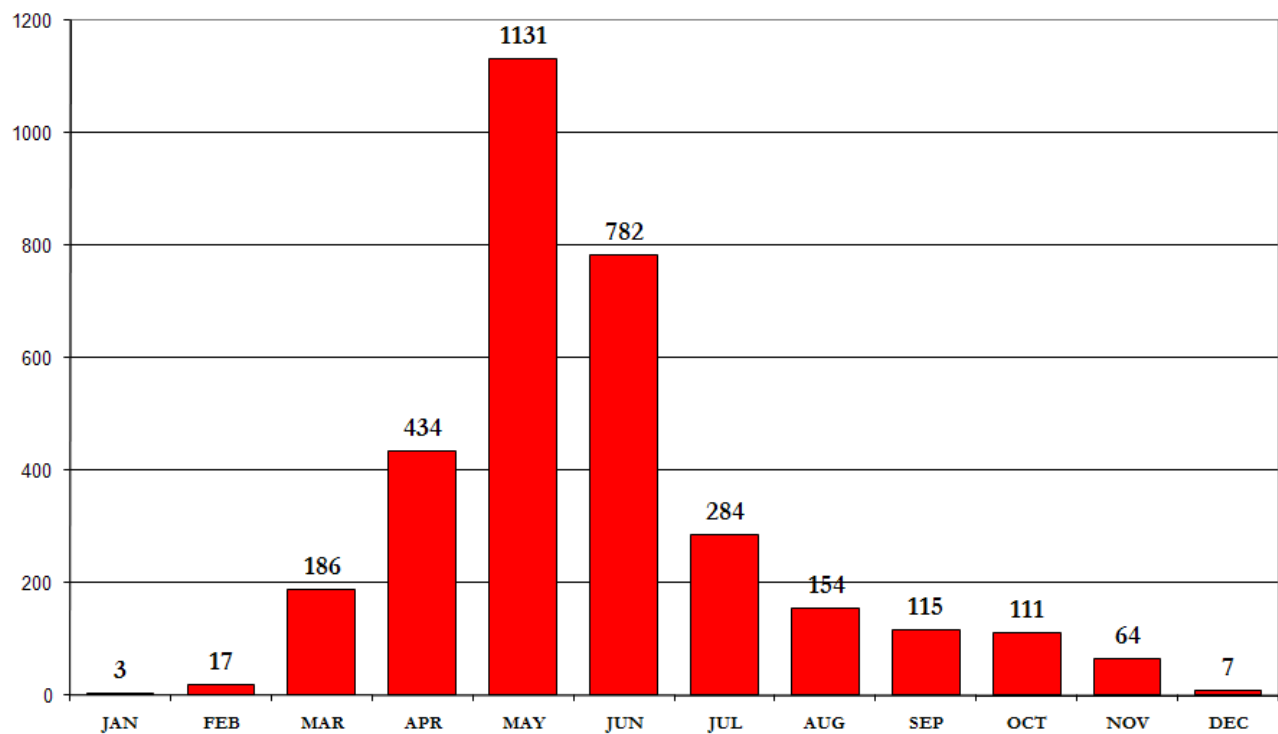
A map of Kansas showing county names and major cities with their elevations. The map is overlaid with a grid of red circles, each representing a city's location and elevation. The cities and their elevations are as follows:

City	Elevation
Wray	162.475
Trenton	162.500
102.525	
Superior	162.525
162.450	
Student	162.500
Cheyenne	
Rawlins	
Decatur	
Norton	
Phillips	
Smith	
Jewell	
Republic	
Washington	
Marshall	
Nemaha	
Brown	
Blue Rapids	
Doniphan	
St. Joseph	162.400
102.425	
Lenora	162.425
Kirwin	162.500
Osborne	
Mitchell	
Cloud	
Concordia	162.550
Clay	
Riley	
Pottawatomie	
Jackson	
Atchison	
Jefferson	
Leavenworth	
Kansas City	162.550
102.475	
Topeka	162.475
Wabasha	
Shawnee	
Osage	
Douglas	
Johnson	
Wyandotte	
Wallace	
Logan	
Gove	
Trego	
Ellis	
Russell	
Lincoln	
Saline	
Dickinson	
Geary	
Wabasha	
Shawnee	
Osage	
Lyon	
Franklin	
Miami	
Halls Summit	162.425
102.525	
Abilene	102.525
McPherson	
Marion	
Chase	
102.400	
Ellsworth	102.400
Rice	
Great Bend	162.500
Stafford	
Reno	
Harvey	
Butler	
Greenwood	
Coffey	
Anderson	
Allen	
Bourbon	
El Dorado	162.475
102.475	
Parker	102.475
Linn	
Woodson	
Wilson	
Neosho	
Crawford	
Chanute	162.400
Labette	
Cherokee	
Joplin	102.425
102.550	
Tribune	102.550
Dighton	102.525
102.525	
Great Bend	162.500
Stafford	
Reno	
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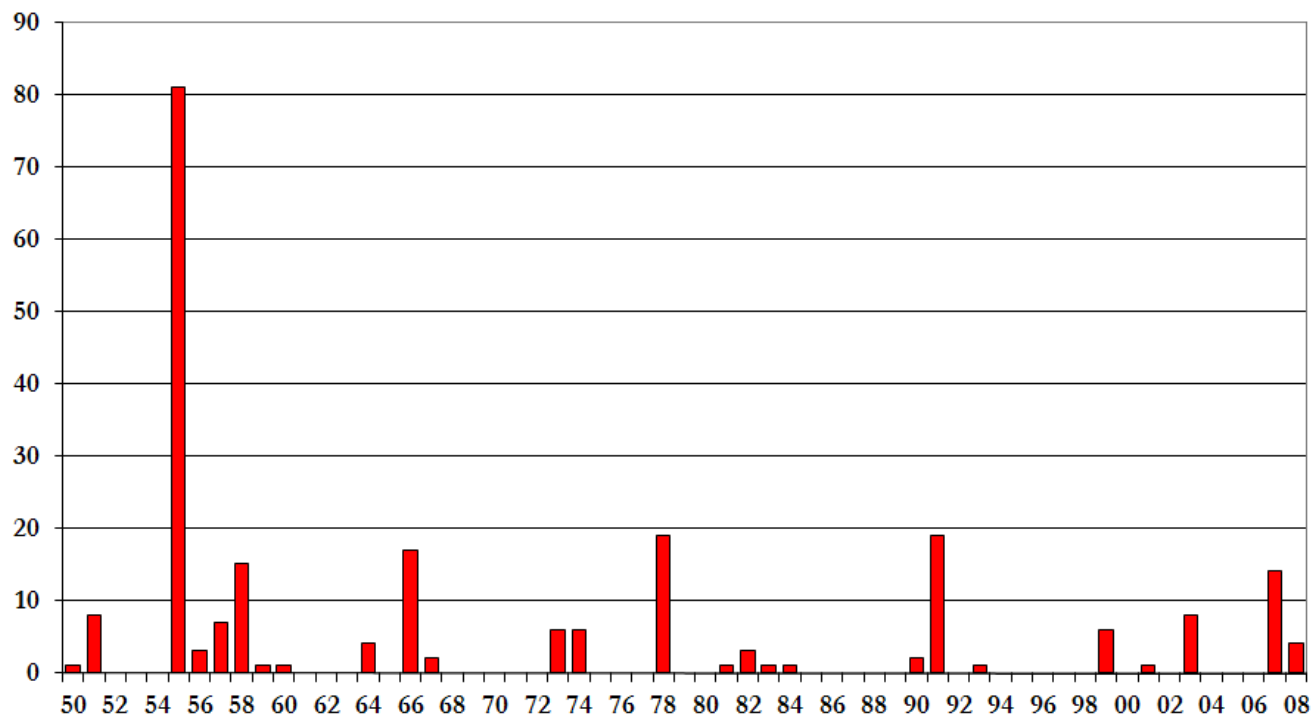
# Kansas Tornadoes



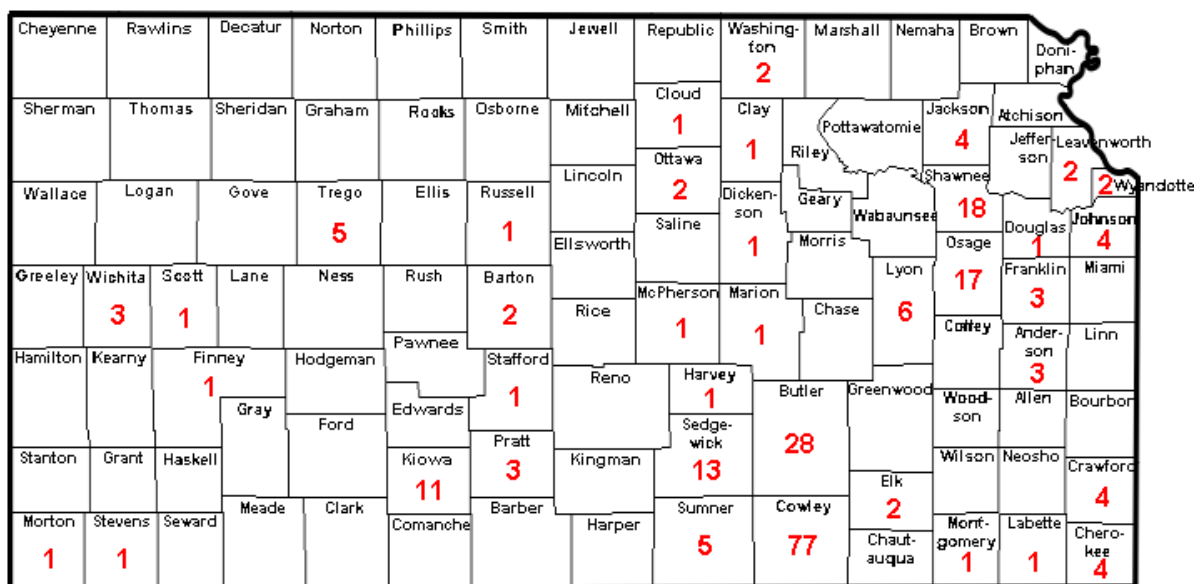
## Kansas Tornadoes 1950 - 2008



# Kansas Tornado Deaths 1950 - 2008

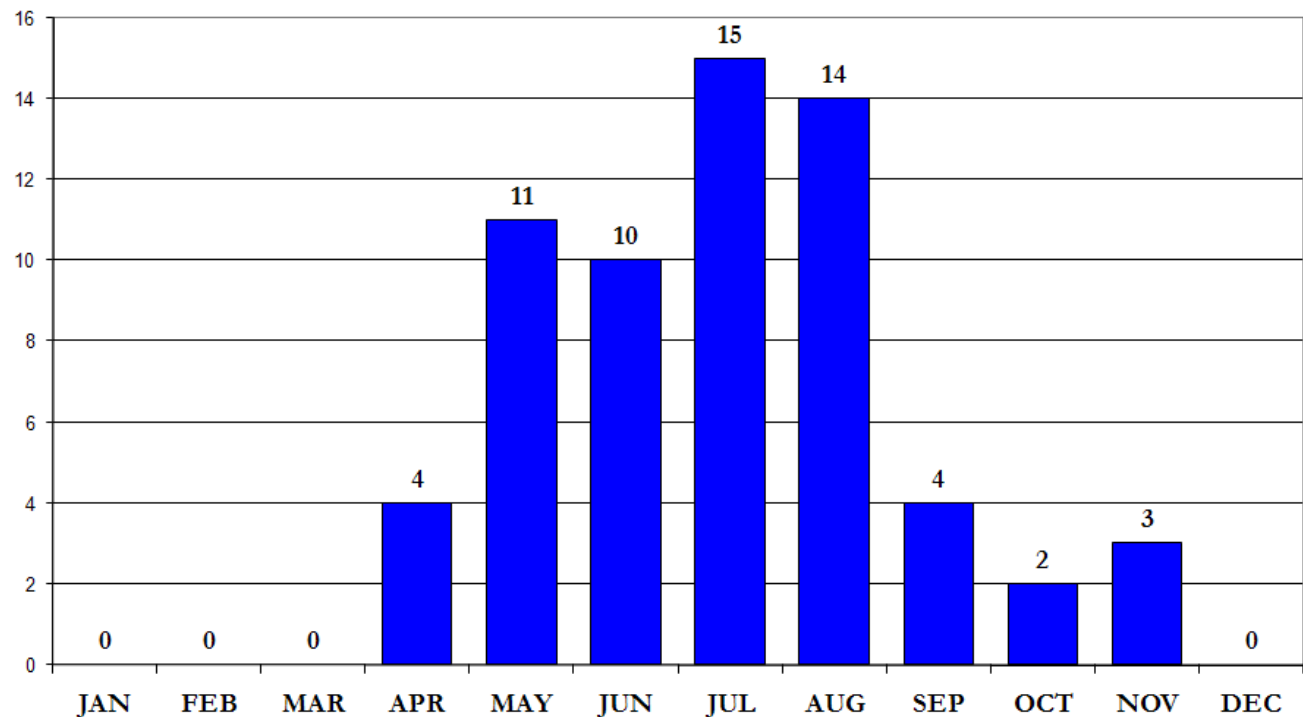


## Kansas Tornado Fatalities 1950-2008



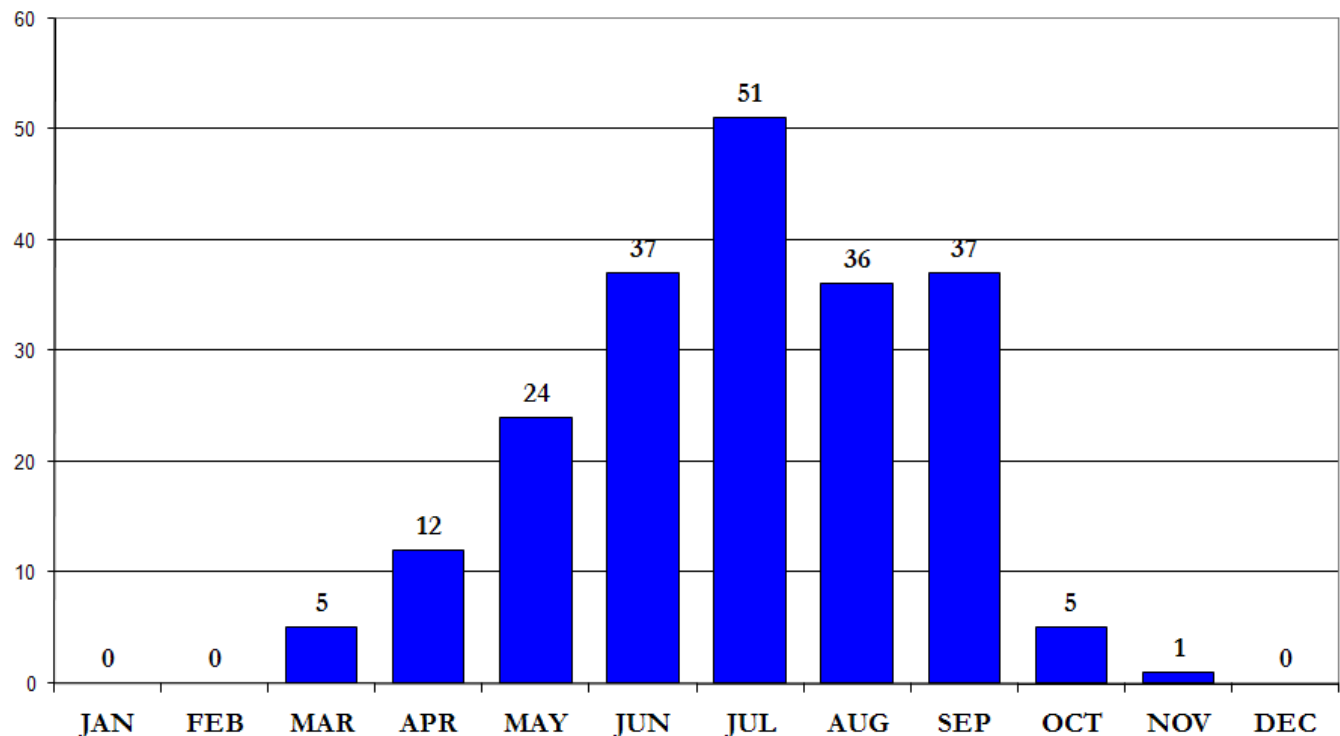
## Kansas Lightning Deaths 1959 - 2008

**Total = 63**

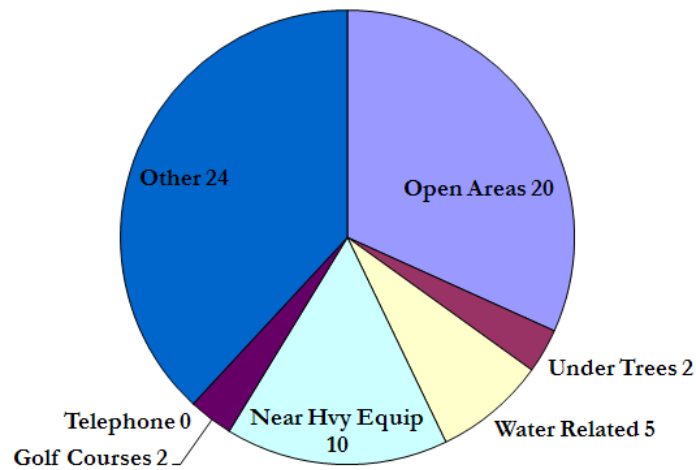


## Kansas Lightning Injuries 1959 - 2008

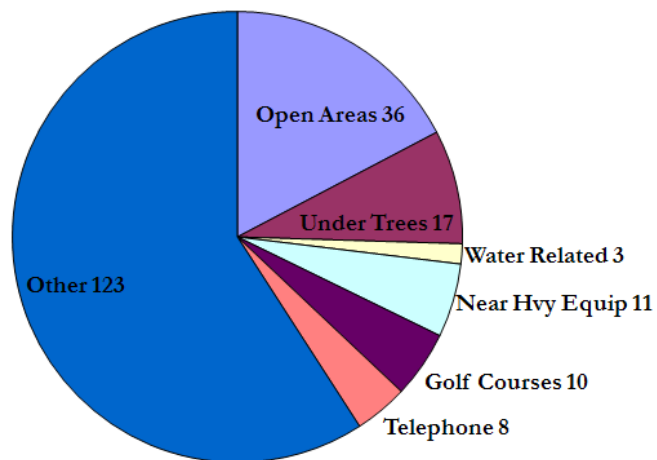
**Total = 208**



## Lightning Death Locations 1959 - 2008



## Lightning Injury Locations 1959 - 2008



KANSAS SEVERE WEATHER AWARENESS WEEK  
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## **2008 Severe Weather Summary**

### **North Central, Northeast and East Central Kansas**

#### **National Weather Service, Topeka**

The 2008 severe weather season in northeast Kansas was active, especially in the months of May and June. During the late afternoon of May 1<sup>st</sup>, hail producing thunderstorms developed along a dryline. The thunderstorms then merged into a squall line during the late evening. Damaging straight line winds up to 80 mph occurred with these thunderstorms and two short lived tornadoes were reported along the line of thunderstorms. One tornado touched down in east central Osage County and was on the ground for 1.5 miles. Although the tornado was short lived and relatively weak, it damaged two residences in its path. The second tornado nearly demolished an unoccupied home in Douglas County southwest of Stull. This tornado was rated an EF2. Both of these tornadoes occurred between 12:30 and 1:15 am and were embedded in a line of thunderstorms, making them nearly impossible for spotters to observe or identify.



National Weather Service photo of a home destroyed south of Stull on May 1, 2008.

On May 29<sup>th</sup>, a supercell moved through portions of north central Kansas and spawned a long-lived tornado that tracked from Jewell County into Republic County in Kansas, and then into Thayer County and finally into Jefferson County, Nebraska before dissipating. The tornado produced considerable damage along its 29.5 mile path through northwest Republic County. The tornado was rated an EF3 in Republic County. At least six residences were reported to have



Aerial photo of tornado damage in Republic County on May 29, 2008. An EF3 tornado tracked for over 29 miles through the northwest part of the county.

been significantly damaged. A few residents of these homes were trapped by debris and needed to be rescued. Other damage occurred to trees, power lines, and farm related outbuildings. In addition, an old school house and cemetery were heavily damaged by the long track tornado. The tornado was up to a half mile wide as it moved across the northwest half of Republic County from 9:34 to 10:12 pm. Numerous storm spotters observed the tornado even though it occurred during the cover of night.



Cars damaged by softball size hail on the southwest side of Manhattan. Photo courtesy of Jay Oyler.

Several significant severe weather events occurred during the first half of June. On June 2<sup>nd</sup>, a cluster of robust severe thunderstorms developed during the morning. Exceptionally strong updrafts within these thunderstorms produced hail up to the size of softballs at several locations across north central, northeast and east central Kansas. The extremely large hailstones caused extensive damage on the southwest side of Manhattan, where the airport, numerous businesses and hundreds of vehicles were heavily damaged. Residents reported needing a flashlight to see during the storms because it was so dark. One resident reported that gravel was shooting ten feet in the air, driven by the large hail. Farm fields across portions of several

counties suffered extensive damage. Small animals were unable to seek shelter and fell victim to the hailstones. One Manhattan resident reported dead rabbits, squirrels, owls, and quail in his neighborhood. Some hail reports from this event include: 3.50" diameter hail in Clay and Morris Counties, 4.25" diameter hail in Riley and Coffey Counties, 3.00" diameter hail in Lyon County, 4.00" diameter hail in Wabaunsee County, and 2.75" diameter hail in Shawnee and Anderson Counties. Millions of dollars in damages occurred with these hailstorms.

The thunderstorms formed a line as they pushed southeastward across east central Kansas, and the primary severe weather threat then became strong winds. Residents and law enforcement officers across portions of Douglas, Franklin, Anderson and Jefferson Counties reported wind gusts in the 60 to 70 mile per hour range. Two individuals in Shawnee County measured wind gusts of 80 miles per hour. Power outages were reported across the city of Topeka, with some residents left without power through that evening.

Later in the same week, June 5<sup>th</sup> was forecast to be a significant tornado day. The Storm Prediction Center in Norman, OK placed much of eastern Kansas in a "high risk" area for tornadic activity. Indeed, six tornadoes occurred in Topeka's area of responsibility. Fortunately, no injuries or deaths occurred with the tornadoes. Three tornadoes occurred in Clay County, with reports of two tornadoes on the ground at the same time. Several homes,

outbuildings and farm equipment were damaged by the tornadoes. One residence that had just experienced the damaging hail on June 2<sup>nd</sup> was hit by a tornado on June 5<sup>th</sup>. The resident of the home stepped outside and photographed the tornado headed toward her home before seeking shelter in the basement. Two EF1 tornadoes and one EF0 tornado were surveyed in Clay County



Photo courtesy of Maureen Pfizenmaier. Tornado struck the Pfizenmaier home shortly after the photo was taken.



and EF0 tornadoes occurred in Washington, Marshall and Brown Counties during this event. The thunderstorms continued east across east central Kansas and produced straight line winds up to 70 mph.

The most active day of the 2008 severe weather season occurred on June 11th. Five tornadoes occurred during the overnight hours and impacted communities from Chapman to Manhattan to



A Chapman home destroyed by an EF3 tornado on June 11<sup>th</sup>. National Weather Service photo.

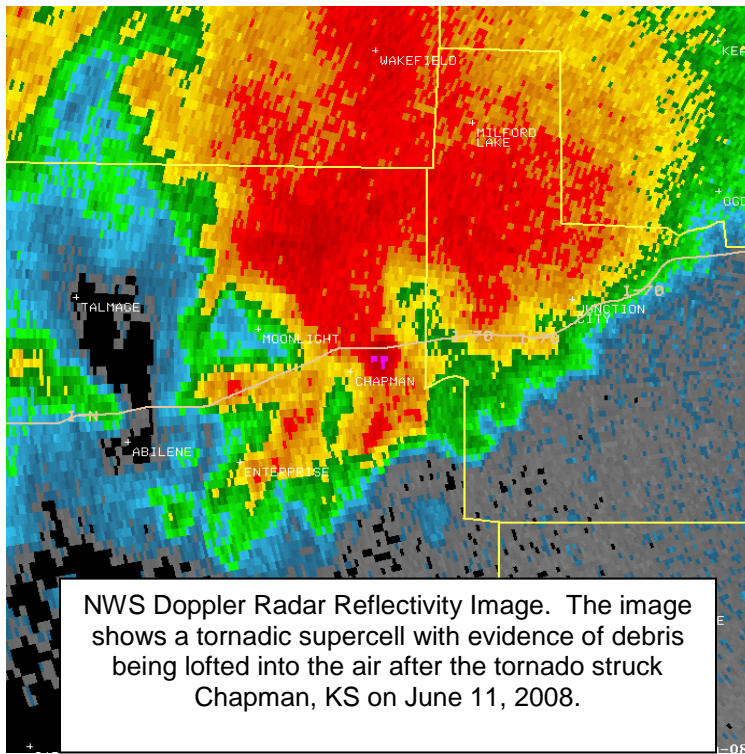


NWS damage photo of neighborhood in Manhattan where an EF4 tornado damaged homes.

Soldier. Unfortunately, two fatalities and three injuries resulted from these strong nighttime tornadoes. In the city of Chapman, a tornado that was up to a half mile wide and rated EF3, had significant impact in that community. Several blocks of homes, both of the community's schools and two churches were completely destroyed. The tornado first touched down just northwest of Enterprise and tracked through rural areas before crossing the Smoky Hill River on the southwest side of Chapman. The tornado then produced a path of destruction throughout the southeast side of the town before again moving into largely rural areas, crossing Interstate 70 and finally lifting just across the Geary County line. This tornado was on the ground for almost 15 miles from 10:12 to 10:27 pm. The same supercell thunderstorm then spawned a tornado that touched down just north northeast of Ogden. As it tracked into the west side of Manhattan and entered a neighborhood, the quarter mile wide tornado produced EF4 damage. The tornado destroyed several homes in this newer subdivision. The tornado continued to move across the city and produced damage along its path that included the Kansas State University campus. Fortunately, the tornado weakened quickly as it moved through the city and no injuries or fatalities occurred.

Additional thunderstorms produced two more tornadoes, one weak tornado in the rural part of western Pottawatomie County and an EF2 tornado that began in eastern Pottawatomie County and tracked through northwest Jackson

County killing an occupant of a mobile home near Soldier. The tornado finally lifted in far southeast Nemaha County where it damaged a cemetery. Another weak tornado was observed near Carlton, in southwest Dickinson County. All of these tornadoes occurred during the nighttime hours and were wrapped in rain, making it very difficult for spotters to observe and report the tornadoes. The sky camera from one Topeka television station captured some video of the tornado as it moved through Manhattan.



Additional severe thunderstorms and two weak tornadoes were reported the following day, June 12<sup>th</sup>. A weak tornado was observed near Auburn in Shawnee County and in Lyon County near Admire. Another round of severe hail producing thunderstorms brought 3 and 4 inch diameter hail to Marshall County, just southwest of Marysville on June 26<sup>th</sup>. Large hail was also reported in parts of Republic, Cloud, Clay, Washington, Nemaha and Wabaunsee Counties during this severe weather event.

A total of 20 tornadoes occurred in the 23 counties that the National Weather Service office in Topeka serves. Additional severe thunderstorms producing large hail

and damaging winds affected many of these counties as well. Severe weather occurs frequently in our state, so it is important for Kansans to remember that severe weather can occur in any location, at any time of the day and in any season of the year.

### **Have you heard the news about NOAA Weather Radio in Kansas????**

NOAA's "All Hazard Weather Radio" network is continuing to grow as we work to fill in the gaps where the reception was weak or non-existent. This past spring, weather radio station WZ2511 began broadcasting from a tower site near Sharon, Kansas in extreme northeast Barber County. This station gave residents in the Gypsum Hills area of south central Kansas and northern Oklahoma service. A second transmitter, KPS511, which is just north of Great Bend was commissioned in early December. This transmitter will fill a void for many residents in Central Kansas. A third transmitter, WZ2512 has been installed near Parker, Kansas and should be operational by January 2009 and commissioned shortly thereafter. This long awaited transmitter will not only fill the gap in coverage in Linn County, but also in several adjacent Kansas and Missouri counties as well. Finally, a new transmitter antenna and cable was installed on the Wichita station KEC-59, which certainly improved its reception. With these additions and enhancements, most everyone across Central, East Central and Southeast Kansas has, or will soon have, a strong NOAA Weather Radio Signal. Several locations can even "Pick and Choose" the Weather Radio station they want to listen to because they will have access to more than one transmitter.

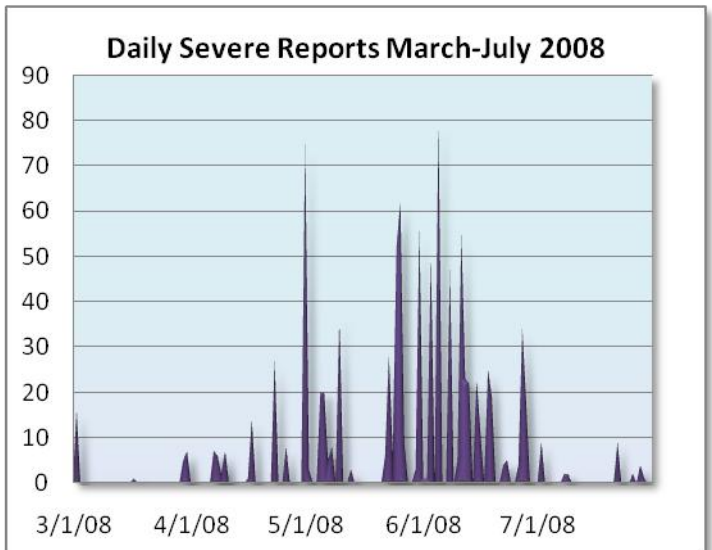
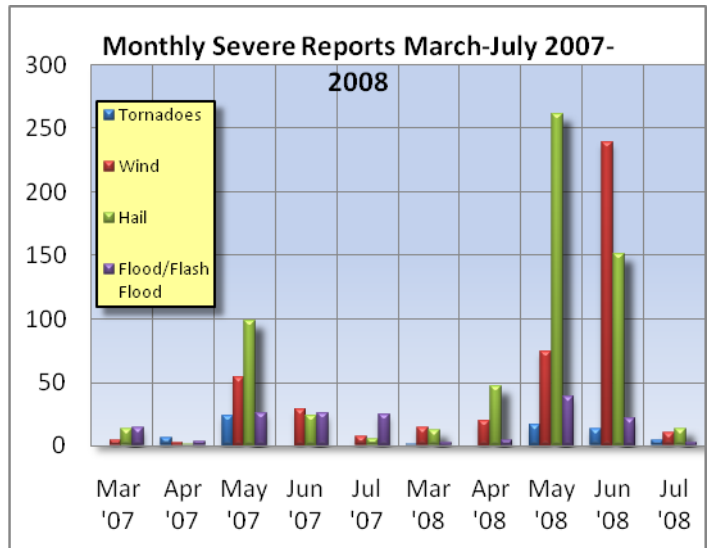
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# 2008 Severe Weather Summary

## A year in review for portions of Central, South Central and Southeast Kansas

### NWS Wichita, KS

The 2008 severe weather season proved to be very active across Wichita's County Warning Area (CWA), which encompasses portions of central, south-central and southeast Kansas. Tornadoes, large hail, damaging winds and flooding inflicted nearly \$5 million in property damage from March-July across the area. There were two severe weather peaks: one from late April through early May, and another from late May through roughly mid June. The 2008 season was much more active than 2007, especially during the months of May and June, as the graph to the left illustrates. For instance, 361 occurrences of severe weather were reported from March-July 2007, while a whopping 945 occurrences of severe weather were reported from the same time period in 2008. Over 60% of those 945 severe reports occurred during a very active period from roughly May 20th through June 20th, 2008, when numerous strong upper level disturbances and associated fronts passed over the area. For the most part, large hail and damaging wind reports dominated each severe weather episode in 2008. Eight severe thunderstorm related injuries were reported from March-July 2008, a very low number considering the amount of severe weather that occurred. There were 2 fatalities due to flooding that occurred in September. It would be nearly impossible to cover all the



significant severe weather events in this article, so a sampling of pictures with captions from the more significant events will be provided.

### April 7<sup>th</sup>

During the evening of Monday April 7th, 2008 and the early morning hours of Tuesday, April 8th, thunderstorms developed and moved across much of Kansas, some of them becoming severe. A severe



thunderstorm bow echo produced damaging straight line winds up to 90 - 100 MPH between midnight and 1am in Butler and Harvey counties.

Straight line damaging winds followed the I-35 turnpike in a line from five miles north of El Dorado to one mile north of Cassoday. The winds blew tractor trailers off of the turnpike with some injuries reported. The wind damage also included numerous downed power lines, damage to numerous outbuildings, and damage to homes and manufactured homes.

## June 11<sup>th</sup>

Widespread damage was noted to several homes, businesses, and trees along the tornadoes path. One cabinet making business had a 10,000 square foot section of roof removed, with a total of 20,000 square feet of damage to the structure when a sprinkler system main broke, pouring water onto the factory floor. Several homes sustained damage due to garage doors collapsing in the wind and ultimately lifting the roofs off of the homes. One home sustained slightly more damage than the rest, as two exterior walls were also blown out.

Powerful supercell thunderstorms erupted along a cold front across Central Kansas during the early evening hours of Wednesday June 11th. These storms quickly became severe as they tracked east producing several tornadoes along with extremely large hail. Tornadoes with damage were first reported across the northeast portion of Barton County, around 8 miles north-northwest of Claflin around 6:40 pm. Roof damage and damage to rural homes and outbuildings resulted from these storms. This same storm tracked through Ellsworth County causing damage to trees and power poles.

A few hours later another intense thunderstorm developed and tracked through Saline County around 9:40 pm producing a tornado. This tornado moved east-northeast with a path length of about 14 miles and a maximum intensity of EF-3. The tornado first touched down just west of I-135 and just south of the Salina Airport. It then traveled along the southeast outskirts of Salina where it damaged several homes, outbuildings, trees and power lines. EF-3 damage was noted near the intersection of East Shilling Road and South Holmes



EF3 tornado damage from the June 11th tornado just southeast of Salina. The damage occurred near the intersection of East Shilling Road and South Holmes Road. Widespread damage was noted to several homes, businesses, and trees along the tornadoes 16-mile path. Total property damage was estimated at roughly 2.63 million dollars. Amazingly, no injuries were reported.

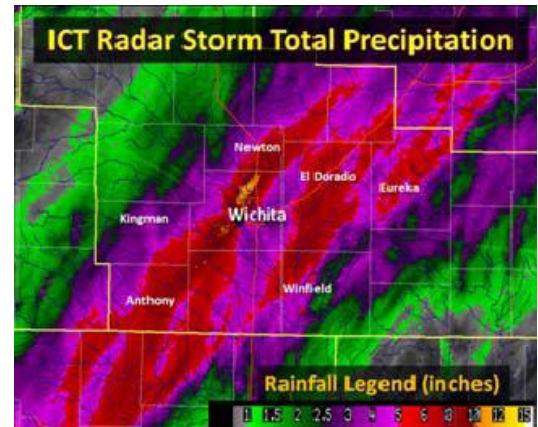


Road. The tornado continued east of Salina with EF-2 damage near East Crawford Street and South Whitmore Road. The tornado continued northeast before crossing into Dickinson County, just south of Solomon. Fortunately there were no reports of injuries in this area. Along with tornadoes, these powerful storms also produced extremely large hail, up to the size of softballs. Around 9:00 pm hail to the size of softballs killed several livestock in Ellsworth County.

## September 12<sup>th</sup>

A record amount of rain fell on the Wichita area on September 12th, 2008. The National Weather Service (NWS) office at the Wichita Mid-Continent Airport measured 10.31 inches of rainfall in 24 hours. This broke numerous records, including the rainfall record for the day, and the most rainfall in a 24-hour period, which was 7.99 inches set on September 6-7, 1911.

The right weather ingredients came together to create this record event. A stationary boundary draped northeast to southwest over the state interacted with the remnants of Tropical Storm Lowell that were streaming northeast from the Baja, Mexico coast. This interaction worked together and allowed enough moisture and lift to keep showers training along in one location. Unfortunately this location was centered over Sedgwick County, with the highest rainfall totals recorded over the flood prone west side of Wichita.



Radar-derived storm-total September 12th, 2008.

Wichita and surrounding communities' city street sewers could not keep up with the deluge of rain, and many area roads were closed because of high water. The height of the flood waters peaked during Friday morning rush hour in Wichita, causing a headache for many area motorists. Over 100 vehicles were stranded due to the high water. There were also many homes flooded during the event, many of which were located along the Cowskin Creek and other small creeks located on the west side of Wichita. According to the Wichita Eagle, over 3 million dollars of property damage occurred in the city of Wichita alone. The flooding caused area schools to dismiss early, and other educational and community activities were cancelled or postponed.

In addition to the street flooding that many areas saw, numerous rivers throughout the county warning area (CWA) also experienced flooding including the following rivers/creeks: Cowskin, Arkansas, Ninnescah, Chikaskia, Cottonwood, Whitewater, Walnut and Neosho. The Walnut River went into the major flood category, cresting near 32 feet, forcing visitors attending the Walnut Valley Festival held near the Walnut River in Winfield to seek higher ground. Needless to say, September 12th, 2008 will be a day that residents in south-central Kansas will not soon forget.

## Was 2008 wet enough for you?

“When it rains, it pours.” That age-old expression has been proven most emphatically this year. Due primarily to monthly record-setting rainfalls in May and September, Wichita is on pace to experience their wettest year on record! After a rather uneventful March and April, during which the Air Capital measured a somewhat mediocre 4.90 inches of rain at Mid-Continent Airport during the 2-month period, nature began to “shower” Wichita with all kinds of attention. Atmospheric mayhem erupted in May, when a record-swamping 13.14 inches of rain inundated the Air Capital, breaking the previous May record of 11.22 inches set way back, surprisingly enough, in 1935, when the Dust Bowl had hit full stride. Thus 2008 had become the 2nd wettest spring on record with 18.04 inches; being only surpassed by 1944 during which 19.01 inches swamped the city.

Summer arrived in a foul mood, when 7.42 inches doused Wichita, and although this wasn't enough to enable 2008 to gain admission into the "Top-10" wettest Junes, the May/June total of 20.56 inches had sump pumps working triple overtime. Nature then eased up on the throttle with 3.82 and 3.00 inches of rain measured in July and August, respectively.



Flooding near 20th and Maize Road in West Wichita.

Then September arrived and suddenly, it appeared Niagara Falls had moved to south central Kansas. Showers and embedded thunderstorms produced 1.43 inches total on the 5<sup>th</sup> and 6<sup>th</sup>, but all this did was 'wet' nature's appetite for more rain; *much* more rain. After numerous showers produced 0.49 inch on the 11<sup>th</sup>, the faucet was turned on *full-throttle* on the 12<sup>th</sup> and left in that position throughout the day and night. By the time the 12<sup>th</sup> had handed off the baton to the 13<sup>th</sup>, a *colossal 10.31 inches of rain* had overwhelmed Mid-Continent Airport. Rainfalls across West and Northwest Wichita frequently reached between *7 and 11 inches*. Lake Wichita had started to form.

This staggering storm surge had already made 2008 the wettest September on record with 12.41 inches to that date, leaving the previous September record-holder, 1999 with 10.69 inches, in its wake by 1.72 inches, and the month was *only 40% completed*. The stupendous rainfall obliterated the previous 24-hour record of 7.99 inches set *way back* on September 6<sup>th</sup> & 7<sup>th</sup> 1911, a record that had stood for *97 years*. The following is a 'Water Log' of the historic September rainfall:

#### **At Wichita's Mid-Continent Airport**

**Greatest 24 hour rainfall:** 10.31 INCHES ON THE 12TH. (Previous record: 7.99 inches on September 6th & 7th, 1911)

**Greatest September rainfall:** 12.96 INCHES. (Previous record: 10.69 inches in 1999).

**Greatest Annual rainfall:** 53.82 INCHES. (Previous record: 50.48 inches in 1951).



Numerous severe thunderstorms developed across south-central and southeast Kansas during the afternoon and evening hours of May 1<sup>st</sup>, ahead of a strong dryline and cold front. Hail up to the size of tennis balls and several weak tornadoes occurred across southeast Kansas. Additionally, winds up to 100 mph caused considerable damage across northern Greenwood County. Above is a photo of the southern end of that same storm as it approached Eureka in Greenwood County. Photo courtesy of Jim Reed.





A bow echo raced across south-central and southeast Kansas during the evening hours of June 3<sup>rd</sup>, producing numerous reports of 60-80 mph wind gusts. The severe winds toppled trees, downed power poles and caused some structure damage. Pictured above are two destroyed 80,000 bushel grain bins near Winfield. Photo courtesy of Brian Stone.



The same cold front from June 11<sup>th</sup> moved southeast, and erupted numerous strong to severe storms over portions of south-central and southeast Kansas on the 12<sup>th</sup>. Pictured above is damage from an EF1 tornado that touched down northeast of Winfield in Cowley County during the evening hours. Additionally, hail as large as baseballs and winds to 80 mph affected portions of southern Sumner County during the early morning hours of the 13<sup>th</sup>.

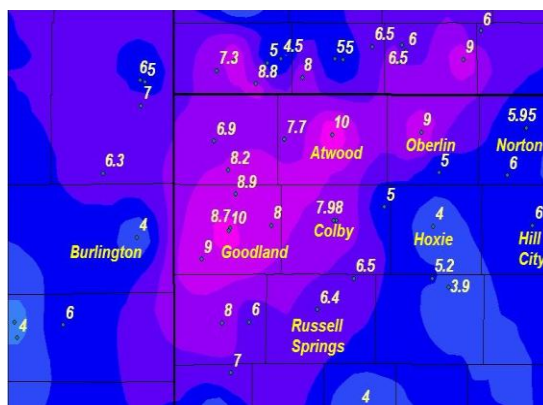


An unseasonably strong late spring storm system sparked numerous severe thunderstorms during the afternoon and evening of June 5<sup>th</sup> across central, south-central and southeast Kansas. This was one of the most widespread and numerous severe weather events of the year, with an estimated 80 severe weather reports across the area.

# 2008 Northwest Kansas Weather Summary

## National Weather Service - Goodland, KS

The first significant weather event of 2008 occurred February 4<sup>th</sup> and 5<sup>th</sup> when a winter storm dropped up to 10 inches of snow across northwest Kansas. The next major snow event occurred April 10<sup>th</sup> when a low pressure system brought up to a half foot of snow and strong winds to the region, resulting in road closures and numerous traffic accidents. With the exception of these two events, the last half of winter was relatively quiet in the northwest part of the state.



Feb. 4-5 Storm Total Snowfall.

The thunderstorm season in northwest Kansas began in earnest on April 24<sup>th</sup>. An estimated 80 mph wind gust was reported west of Nicodemus in Graham County; with nickel to golf ball sized hail reported in Rawlins, Thomas and Sheridan Counties. A large supercell thunderstorm then moved east across Sheridan County during the evening causing extensive damage in Selden. Grapefruit to softball sized hail occurred in town for 20 minutes, producing roof damage and broken windows in homes and damaging vehicles. Hail damage was estimated at over \$600,000.



Photo courtesy Pappy Lies, Logan-Gove county emergency manager. May 23, 2008

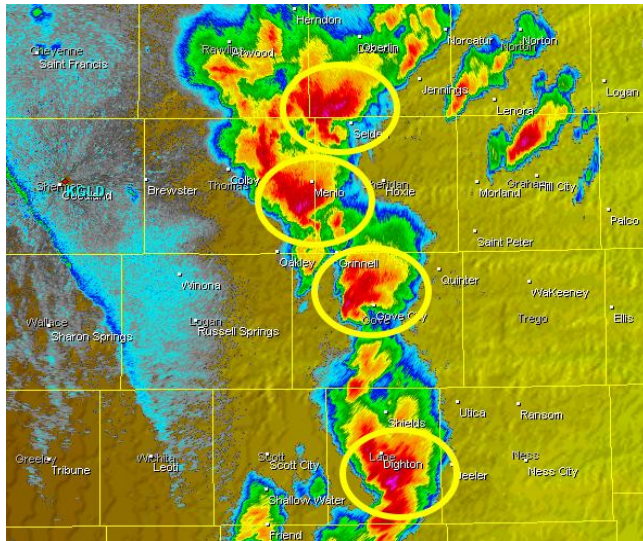
The month of May in northwest Kansas was noteworthy both in terms of the number of tornadoes as well as their intensity. Twenty-six tornadoes occurred during the month (25 in Kansas and 1 in extreme eastern Colorado) which set a new record for May in the Goodland warning area. May 22<sup>nd</sup> and 23<sup>rd</sup> were back-to-back major tornado days, with 11 tornadoes occurring each day, including five EF1-EF2 tornadoes on the 22<sup>nd</sup>, and four EF1-EF4 tornadoes on the 23<sup>rd</sup>. The most significant tornado (rated EF4, photo left) developed in Gove County 9 miles southwest of

Quinter on May 23<sup>rd</sup>. It was the first tornado rated (E)F4 in the Goodland 19 county warning area since 1990. This wedge tornado produced \$2.5 million dollars in damage and completely destroyed a home (see photo, right) and severely damaged about a dozen others. Two injuries occurred with this tornado. One occurred on I-70 when a vehicle was rolled into a ditch as the storm crossed the Interstate. The second occurred when a resident was hit with debris while attempting to enter his outdoor, underground storm shelter. Baseball hail and lowland flooding also accompanied these storms.



EF4 damage May 23, 2008 ... NWS survey





Supercell thunderstorms (yellow circles) lined up and moving north on May 22, 2008

The radar image (shown left) shows a line of supercell thunderstorms moving north during the late afternoon on May 23<sup>rd</sup>.

June was another active tornado month with 11 tornadoes (five in Kansas, six in eastern Colorado). Every tornado was rated EF0 with path lengths under a mile and time on the ground ranging from 1 to 6 minutes. In Kansas, 43 severe hail reports and 8 high wind reports were received from spotters and law enforcement during the month. On June 22, the first day of our lightning awareness campaign, ironically three workers were shocked when lightning struck their natural gas drilling rig during the evening. Two were taken to a nearby hospital, treated overnight and released.



Photo courtesy Larry Townsend,  
Wallace county sheriff

The weather in July was fairly typical of mid-summer in terms of severe reports. The number of tornadoes dropped off considerably with only one tornado reported (eastern Sherman County, seen from the NWS office). Meanwhile, the number of microburst, moderate hail and isolated flooding reports held constant. One noteworthy intense microburst event occurred in Wallace County just south and east of Sharon Springs on July 17. Car ports and tree limbs were damaged, and utility poles were broken. A shop building (photo, left) was also heavily damaged with winds estimated at 80 mph.

counties served by Goodland. Most severe reports were wind related. A strong, but localized microburst occurred during the night in Goodland on August 7<sup>th</sup> which produced minor damage at the Sherman county fairgrounds during fair week. Tents and outdoor game booths were damaged, resulting in \$22,000 in damage. Another intense straight line wind event occurred in Graham County during the early morning hours on the 14<sup>th</sup>. The Hill City ASOS measured an 83 mph wind gust, which damaged trees and utility poles in and around town. Many residents were without power.

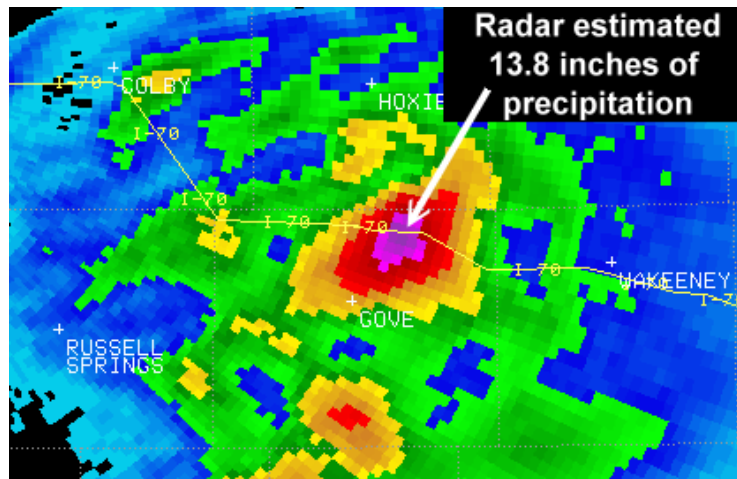


Photo courtesy Brad Schick, NWS Goodland

In September, the most significant event was a flash flood which accompanied extremely heavy rainfall on the 24<sup>th</sup>. An

unofficial report of 10.6 inches was received at the home of a county road department employee just southeast of Grainfield, which agreed well with the radar estimated location of heavy rainfall. Numerous county roads were closed near Park and south of Quinter in Gove County.

The last tornado of the season was a brief spin-up near Edson on I-70 on October 11<sup>th</sup> on the leading edge of a line of thunderstorms. No damage was reported.



September 24, 2008

Thirty-one tornadoes were logged in 2008 in the Kansas counties served by the Goodland office (which serves 3 Colorado, 3 Nebraska and 13 Kansas counties). 2008 is tied for third place (39) in terms of the number of tornadoes occurring in the Goodland office area of responsibility.

## **2008 North Central Kansas Weather Summary**

### **National Weather Service, Hastings, NE**

The year began with a very interesting weather event. About an inch of wet snow fell during the early morning hours of January 10<sup>th</sup> and was then followed by some strong and gusty winds. The winds started moving the snow and this produced what is called “Snow Rollers”. In some cases, the snowballs grew upwards of 8 to 10 inches in diameter. These were very common during the day of the 10<sup>th</sup> in Jewell County.



The severe thunderstorm season started out on April 25<sup>th</sup> in Mitchell County when an EF2 tornado touched down north of Beloit and traveled east into Cloud County. The tornado did occur around the midnight hour making it very difficult to see. The tornado caused damage along its 15 mile path that was from a quarter to a half mile wide. During the 35 minutes it was on the ground, it damaged several homes, outbuildings, trees and power lines.

The big event in May was the heavy rainfall that occurred between May 22<sup>nd</sup> and 24<sup>th</sup>. During that time, the area from Plainville to Phillipsburg to Smith Center received 3 to 6 inches of rain. Nearly six inches of rain (5.83”) fell at Phillipsburg, five and a third (5.36”) at Damar, about five and a quarter (5.23”) at Smith Center, and four inches (4.02”) fell near Plainville. The runoff from the rain caused both forks of the Solomon River and other tributaries to overflow their banks. The North Fork of the Solomon near Portis crested nearly 10 feet above flood stage as did the South Fork of the Solomon near Woodston.



An outbreak of tornadoes occurred on May 29<sup>th</sup> across north-central Kansas. Tornadoes caused scattered damage from south of Palco in Rooks County, across parts of Osborne County and into northern Mitchell and southern Jewell Counties. The worst damage was in the community of Jewell where an EF3 tornado slammed into the west and north sides of town. The damage in the town of Jewell included the downing of the city's water tower, several local businesses, homes and trees. The twister started near Glen Elder Dam and

was on the ground about 18 miles. In the rural areas, the tornado damaged outbuildings, power lines and a few farmsteads.

A few severe events occurred in the month of June. The first was 3 tornadoes briefly set down in Osborne and Smith Counties on the 7<sup>th</sup>. They happened in rural areas and caused no damage. Then on the 26<sup>th</sup>, thunderstorms produced winds of 60 to 80 mph and hail up to the size of hen eggs across most of north-central Kansas. The most notable damage was in the Plainville area where the wind caused some minor damage to area buildings, including at the new hospital construction site.

Severe storms on July 26<sup>th</sup> brought hail to the size of baseballs to Prairie View, golf ball sized hail near Phillipsburg and quarter sized hail stones near Stockton. Rains returned to north-central Kansas on August 23<sup>rd</sup> and 24<sup>th</sup>. From two to five inches fell across parts of the area. The larger rainfall amounts include: 4.80" at Alton, 4.21" at Woodston, 3.50" south of Osborne and 2.64" at Glade. The rains caused some flooding of lowlands, creeks and rural roads.

October was a very wet month across the area. Several locations saw new records established for the monthly total of rain with amounts from five to eight and a half inches. Some spots where the new records were set include Smith Center, Alton, Mankato, Plainville, Cawker City, Beloit and Ionia.



### **Did you know that there are seven National Weather Service offices that serve portions of Kansas?**

The NWS offices are located in Goodland, Dodge City, Wichita, Topeka, Hastings, Nebraska, Pleasant Hill, Missouri and Springfield, Missouri. Each office is staffed by a team of highly trained meteorologists, technicians, electronics technicians, information technology specialists, hydrologists and administrative assistants. The NWS offices are staffed 24 hours a day, seven days a week, 365 days a year.

Contact the NWS office in your area to learn more about weather, weather safety, NOAA Weather Radio, for office tours or to learn more about careers in meteorology, in the NWS or in NOAA. We are here to serve you!

**KANSAS SEVERE WEATHER AWARENESS WEEK  
MARCH 9 – 13, 2009**



# 2008 Extreme Southeast Kansas Weather Summary

## By: Doug Cramer, NWS Springfield, Missouri

Extreme southeast Kansas experienced three ice storms during the 2007 and 2008 winter season. Following a major ice storm in December of 2007 that brought two inches of freezing rain over Cherokee and Crawford Counties, two additional ice storms occurred in February of 2008. These storms impacted the region with sleet and freezing rain accumulations ranging from one quarter of an inch to three quarters of an inch.



Ice Storm Damage in Cherokee County Kansas

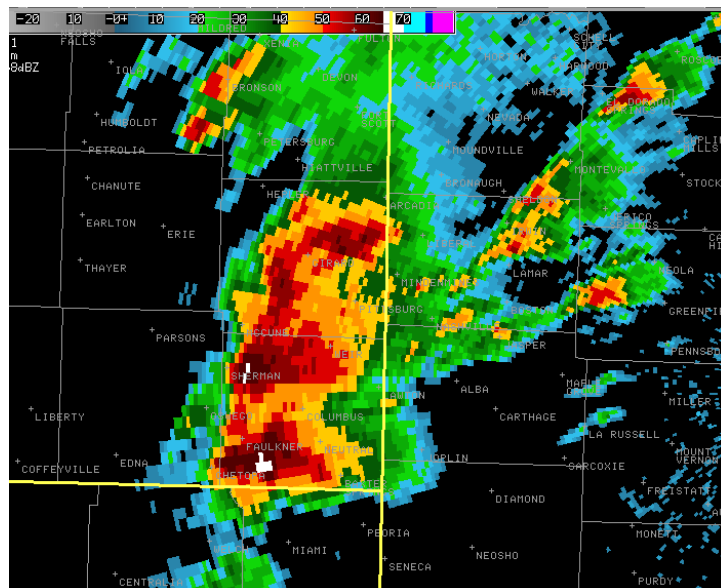
Perhaps the greatest impact over extreme southeast Kansas in 2008 was due to flooding. From March through June, 31.25 inches of rain was measured at the Pittsburg Water Treatment Plant, an official COOP observer. Homes along the Spring River and Shoal Creek in Cherokee County were flooded for the 2<sup>nd</sup> year in a row. Lightning Creek and Cow Creek in Crawford County were also significantly impacted. Bourbon County received less rain; however, the Marmaton and Little Osage Rivers experienced a couple bouts of moderate flooding.



Flooding along the Spring River in Baxter Springs  
near the Highway 166 bridge

May 10<sup>th</sup> became a historic day, mainly for residents of Ottawa County, Oklahoma and Newton County, Missouri. A deadly EF-4 tornado directly impacted the community of Picher, Oklahoma, eventually moving into areas near Racine, Missouri. The supercell that spawned this tornado, tracked over Cherokee County, Kansas, generating a swath of baseball to softball sized hail along the Highway 166 corridor. The city of Baxter Springs experienced significant damage to vehicles and structures from this large hail.

An additional supercell was tracking across central and northern Cherokee County. This storm produced a weak EF-0 tornado near the community of Faulkner, Kansas.



NWS Doppler Radar reflectivity image of the supercells that produced severe weather in Cherokee County on May 10, 2008

Several severe weather episodes that produced large hail and damaging winds occurred during the month of June. One episode in particular that occurred June 3<sup>rd</sup>, featured an intense squall line that produced damaging winds in excess of 70 mph. Three individuals in the community of Frontenac sustained injuries from a large tree that fell on the vehicle they were commuting in.

The remnants of Hurricane Gustav and Hurricane Ike clipped extreme southeast Kansas, causing minor flooding during the month of September. Rainfall totals from these two tropical systems ranged from two to six inches.

### **Check out a Storm Spotter and Weather Safety Training presentation near you this spring...**

Each spring the National Weather Service offices that serve the state of Kansas, conduct storm spotter and weather safety training sessions in each county. The sessions are free and open to the public. You are not required to become a storm spotter, nor will you have to take a test; however the presentations provide a great deal of information on severe weather in Kansas. They cover severe weather safety, ways to get weather information from the National Weather Service and you can meet a meteorologist from your local National Weather Service office.

The schedule for storm spotter training sessions varies in each community, please check out [www.weather.gov](http://www.weather.gov) for more information on a training session in your area.

**KANSAS SEVERE WEATHER AWARENESS WEEK  
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## **2008 Severe Weather Summary**

### **Extreme East Central and Northeast Kansas**

### **National Weather Service Pleasant Hill, MO**

The 2008 severe weather season across extreme east central and northeast Kansas was more active than the past few years, with numerous storm systems bringing large hail, damaging wind and isolated tornadoes.

Two rounds of severe storms started out the month of May. Hail ranging from the size of quarters to golf balls occurred during the evening of May 1 across Johnson, Wyandotte and Leavenworth Counties. The second round of severe weather rolled through just after midnight on May 2. Strong damaging winds of 65 to 75 mph blew through Johnson, Wyandotte and Leavenworth counties, as a bow echo developed over east central Kansas and moved east-northeast. The winds caused widespread damage and power outages across the area. The bow echo went on to produce brief tornado touchdowns along its leading edge, in the north and northeast sections of the Kansas City metro area.

June was the most active month across extreme east central and northeast Kansas. A severe thunderstorm complex moved across far northeast Kansas during the late morning hours of June 2. Large hail from half dollar to golf ball size accompanied the storms. In addition, thunderstorm wind gusts estimated between 60 and 80 miles an hour, felled trees and even tore a roof off a home near Trading Post in northeast Linn Co. Another round of golf ball size hail and flash flooding occurred on June 3. On June 5, an EF0 tornado briefly touched down 2 miles northeast of Prescott in Linn Co. The tornado damaged or destroyed several barns and sheds as it traveled about 1 mile to the northeast before lifting.

A very powerful supercell developed near Leavenworth and tracked eastward during the evening hours of June 15. From the moment it developed, this storm exhibited the classic signs of producing very large hail. Some of the largest hail reported in this storm was around 2.75 inches in diameter near Leavenworth. Due to the very strong upward motion of the storm, large hail was actually thrown out of the storm and landed in places where the skies were still blue!

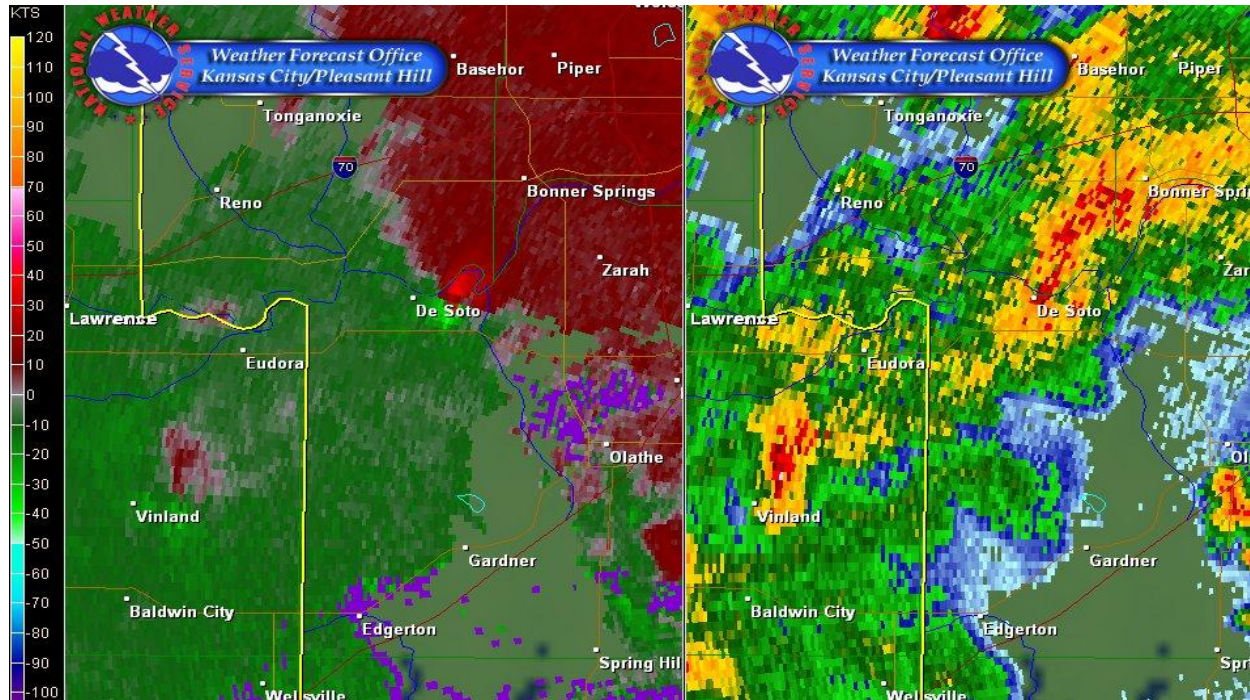


Continuing the trend of severe weather on the 2<sup>nd</sup> day of the month, July 2 saw severe weather sweep across eastern Kansas and western Missouri, bringing large hail, damaging wind and flooding. The long duration severe weather event began across the Kansas City Metro area, as a cluster of HP supercells produced up to baseball sized hail, as well as small bowing segments which produced damaging straight line winds. In addition, torrential rainfall upward of 6.50 inches fell across portions of the Kansas City metro area, resulting in major flash flooding across Leavenworth and Wyandotte counties.

A late summer severe weather outbreak hit eastern Kansas on September 12. Several low-top severe thunderstorms spawned brief tornadoes over parts of east central Kansas during the late



afternoon and early evening hours. Most of the EF0 tornadoes were observed in open country and caused no damage. However, one did cause some minor house damage near De Soto in northwest Johnson County. It is often difficult to see thunderstorm structure in low-top supercells, however this velocity image clearly shows the rotational couplet associated with the De Soto tornado.



### Severe Weather Terminology

**Severe Thunderstorm** – The National Weather Service issues severe thunderstorm warnings for thunderstorms that are currently producing or are capable of producing winds of 60 mph or stronger and/or hail one inch in diameter or larger. Oftentimes, severe thunderstorms may be much stronger than this minimum criteria, so it is a good idea to take severe thunderstorm warnings seriously.

**Tornado** – A tornado is a rotating column of air that descends from the base of a thunderstorm and is in contact with the ground. A funnel cloud may or may not be attached to the base of a thunderstorm and it does not come in contact with the ground.

**Flash Flood** – A flash flood is flooding that occurs very rapidly, usually within 6 hours of heavy rainfall. Flash flooding may occur along creeks, rivers or streams. It can also occur in low lying or urban areas where drainage is poor. With flash flooding, water levels can rise very quickly, even at locations that did not receive the heavy rainfall but are located downstream from areas that received an extreme amount of rainfall. Flash flooding can occur in the winter months, when rain falls on existing snowpack and causes it to melt rapidly. Flooding is the number one severe weather killer in the U.S.

**KANSAS SEVERE WEATHER AWARENESS WEEK**  
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# 2008 Severe Weather Summary

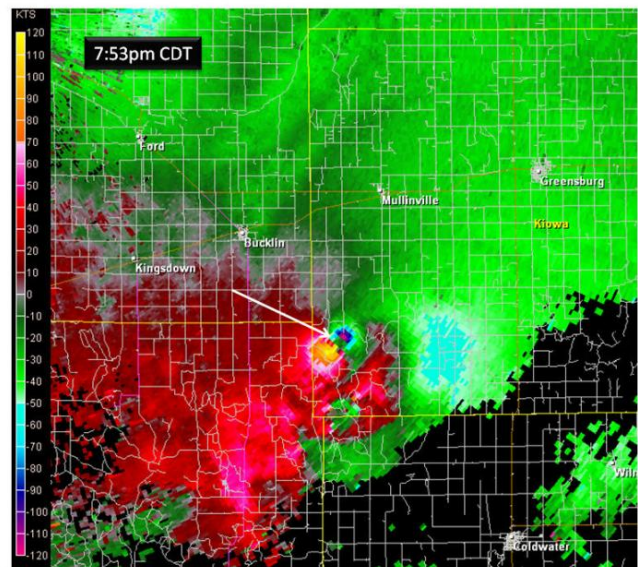
## Southwest Kansas

### National Weather Service, Dodge City

The new year of 2008 started out rather tranquil with the absence of any severe winter weather. It did get very dry in March but there was very little significant weather until late spring and then WHAM! May 22<sup>nd</sup> started a remarkable period when a record number of tornadoes occurred across the area. Although there were six tornadoes on the 22<sup>nd</sup>, the following day will go down as an extremely active 24 hour period of severe weather, when an astonishing 55 tornadoes raked the area. Unfortunately the tornadoes caused loss of life and caused serious injuries. One long tracked tornado of EF3 intensity killed a couple traveling along US Highway 54 in Pratt County and also caused two other injuries at that location. Another large and long tracked tornado caused serious injury to an occupant in Edwards County while yet another tornado injured a woman in Ellis County.



At one time another very large tornado had its sights on Greensburg! However, that 1.8 mile wide monster weakened and turned north before it reached the 2007 tornado ravaged town. There were other smaller tornadoes that occurred in close proximity to the town. Of the 55 tornadoes that day, there were 28 EF0's, 14 EF1's, 8 EF2's and 5 EF3's. Ten of the tornadoes were ½ mile wide or wider and 2 were a mile wide or wider!



Another less significant outbreak of tornadoes occurred on the 25th and also again on the 26<sup>th</sup>. For May there were 73 tornadoes in our area! The average for an entire year is 14!

There were additional tornadoes (albeit smaller and less intense) in June and even July. But the most remarkable tornado was probably the one that occurred in November in Stanton County. On November 10<sup>th</sup>, a 200 yard wide tornado persisted for 10 minutes and traveled 2.9 miles, and the associated thunderstorm turned the ground white from hail. As the tornado was occurring, the air temperature to the east of the tornado was only 53 degrees! Under the right atmospheric conditions, tornadoes can occur just about any time of the year, so it's always important to stay

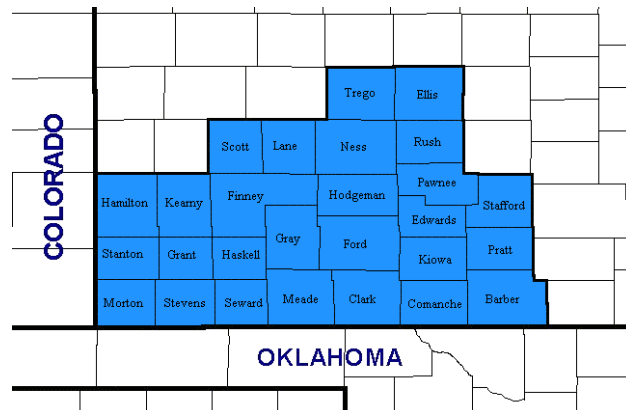
abreast of current weather conditions. Fortunately there were no injuries or damage reported with this tornado. Winds were estimated at 70 mph just east of the tornado however.

The pictures below are of the November 10<sup>th</sup> tornado producing thunderstorm and of the tornado itself. The photographs are courtesy of NWS Meteorologist Mike Umscheid.



Other than the November tornadoes, the remainder of the year remained relatively calm although an outbreak of cold air invaded the region on the 14<sup>th</sup> of December.

For 2008 there was a record number of tornadoes in southwest Kansas (within the area shown). An unbelievable 81 tornadoes were documented! This follows 2007 when 57 occurred; 2006 with 41; and 2005 with 52! Hopefully 2009 will be a quieter year but based on recent past history this may not be the case.



## **Kansas Tornado Facts**

### **Days with more than 20 tornadoes**

<b><u>Date</u></b>	<b><u>#Tornadoes</u></b>
05/23/08	70
06/15/92	39
05/05/07	36
06/04/55	33
05/29/04	28
10/26/06	28
05/25/97	25
06/09/05	25
05/15/91	24
07/07/04	23
04/26/91	21

### **Kansas Tornado Count By Decade**

1950s:	560
1960s:	457
1970s:	303
1980s:	339
1990s:	789
2000s:	1089 (thru 2008)

### **Most Tornadoes in One Episode**

May 23, 2008	70 Tornadoes
June 15-16, 1992	41 Tornadoes

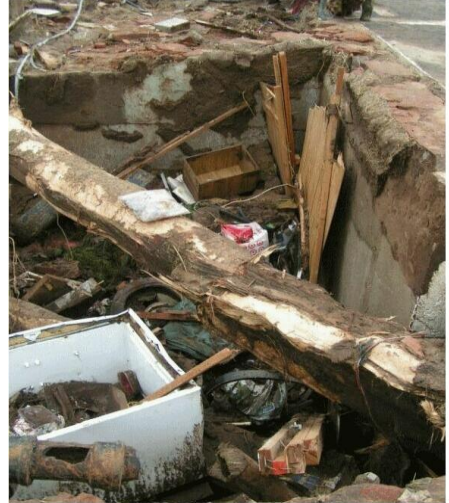


# ***Tornado Safety***

When it comes to tornado safety, there is not any fool proof measure that can guarantee your safety. However, by following the tips listed below, your chances of survival are greatly increased.

## **Before a tornado strikes:**

1. Look for approaching storms which:
  - a. May include a dark greenish tint
  - b. Contain large hail
  - c. Produce a loud roaring noise of rushing wind
2. Monitor NOAA Weather Radio for the latest updates
3. Monitor local media for the latest warnings from the National Weather Service



Basement filled with debris. The couple were along the west wall which is to the right.

## **Where to go when a tornado warning has been issued for your area:**

### **1. Indoors:**

- a. Go to a pre-designated shelter area such as a safe room, basement, storm cellar, or the lowest building level. If there is no basement, go to the center of an interior room on the lowest level (closet, interior hallway) away from corners, windows, doors, and outside walls. Put as many walls as possible between you and the outside. Get under a sturdy table and use your arms to protect your head and neck. Do not open windows.

### **2. In a vehicle:**

- a. Your 1<sup>st</sup> option might be driving away from the danger. Notice the direction of movement of the tornado and drive at a right angle to a shelter. Remember to drive at a right angle, never try to outrun the tornado.
- b. Otherwise, get out of your vehicle and lie flat in a nearby ditch or depression and cover your head with your hands. Be aware of the potential for flooding.
- c. Do not get under an overpass or bridge. You are safer in a low, flat location.
- d. At night, the tornado may be nearly impossible to see. Err on the side of caution and get out of your vehicle and into a sturdy shelter or nearby ditch.

### **3. In a trailer or mobile home:**

- a. Get out immediately and go to the lowest floor of a sturdy, nearby building or a storm shelter. Mobile homes, even if tied down, offer little protection from tornadoes.

If all else fails remember the word **DUCK**:

**Down** to the lowest level

**Under** something sturdy

**Cover** your head

**Keep** in shelter until the storm passes

# Lightning - The Underrated Killer

In the United States, there are an estimated 25 million lightning flashes each year. During the past 30 years, lightning killed an average of 62 people per year. This ties the average of 62 deaths per year caused by tornadoes. Yet, because lightning usually claims only one or two victims at a time and does not cause mass destruction of property, it is underrated as a risk. While documented lightning injuries in the United States average about 300 per year, undocumented injuries are likely much higher.

- **Watch for Developing Thunderstorms:** Thunderstorms are most likely to develop on spring or summer days, but can occur year round. As the sun heats the air, pockets of warmer air start to rise and cumulus clouds form. Continued heating can cause these clouds to grow vertically into towering cumulus clouds, often the first sign of a developing thunderstorm.
- **An Approaching Thunderstorm: When to Seek Safe Shelter:** Lightning can strike as far as 10 miles from an area where it is raining. That's about the distance you can hear thunder. **If you can hear thunder, you are within striking distance. Seek safe shelter immediately.**
- **Outdoor Activities: Minimize the Risk of Being Struck:** Most lightning deaths and injuries occur in the summer. Where organized outdoor sports activities take place, coaches, camp counselors and other adults must stop activities at the first roar of thunder to ensure everyone time to get a large building or enclosed vehicle. Leaders of outdoors events should have a written plan that all staff are aware of and enforce.
- **Indoor Activities: Things to Avoid:** If you are inside a building, stay off corded phones, computers and other electrical equipment that put you in direct contact with electricity. Stay away from pools, indoor or outdoor, tubs, showers and other plumbing. Buy surge suppressors for key equipment. Install ground fault protectors on circuits near water or outdoors. When inside, wait 30 minutes after the last strike, before going out again.
- **Helping a Lightning Strike Victim:** If a person is struck by lightning, call 911 and get medical care immediately. Cardiac arrest and irregularities, burns, and nerve damage are common in cases where people are struck by lightning. However, with proper treatment, including CPR if necessary, most victims survive a lightning strike. You are in no danger helping a lightning victim. The charge will not affect you.
- **Summary: Lightning is Dangerous!** With common sense, you can greatly increase your safety and the safety of those you are with. At the first clap of thunder, go to a large building or fully enclosed vehicle and wait 30 minutes after the last clap of thunder to go back outside.



## When Thunder Roars, Go Indoors!

KANSAS SEVERE WEATHER AWARENESS WEEK  
MARCH 9 – 13, 2009

# Flood Safety

Did you know that floods, especially flash floods, kill more people each year than any other weather phenomenon? And do you know why? Well, the main reason is that people underestimate the force and power of water. As little as six inches of fast moving water can sweep you off your feet and 18 to 24 inches of water is enough to float a car and carry it away. If you see a road barrier across a flooded roadway, then “**Turn Around. Don’t Drown!**” This is the National Weather Service’s motto. We want you to remember this if you encounter a situation where you see water covering a roadway. You will not know the depth of the water or know the condition of the road under the water. Did you also know that about 60 percent of all flood deaths result from people trying to cross flooded roads in vehicles when the moving water sweeps them away? **So Turn Around. Don’t Drown!** Don’t become one of the statistics.

Helpful safety rules to adhere to:

When heavy rains threaten, monitor NOAA Weather Radio or favorite news source for weather information. If flooding occurs, get to higher ground. Leave areas subject to flooding, such as dips, low spots and underpasses. Avoid areas already flooded. Do not attempt to cross flowing streams. Never drive through flooded roadways. **Turn Around. Don’t Drown.** If your vehicle is suddenly caught in rising water, leave it immediately and seek higher ground. Look for a floatation device. Be especially cautious at night when it is harder to see flood dangers.



Please report flooding to your local authorities or The National Weather Service. Finally, know when you are at risk. Keep abreast of the latest weather watches and warnings. Let caution and good sense be your guides. Remember, **Turn Around. Don’t Drown!**

# Damaging Thunderstorm Winds

Many times when storm damage occurs to buildings, trees or other objects, people automatically say it was a **Tornado!** The “glamour” of having a tornado seems to overwhelm scientific evidence and common sense. Although difficult for many to understand, in most years, **thunderstorm winds cause more damage, and are more frequent than tornadoes.** In addition, property and crop damage can be more severe from thunderstorm winds than from tornadoes. Thunderstorms winds can exceed 100 mph while the most common tornado winds are generally not this strong.



Thunderstorm winds come in many forms, sometimes from squall lines or downburst winds. The most frequently encountered type of damaging **straight-line wind** in a thunderstorm is that associated with the leading edge of the rain-cooled outflow, known as the **gust front**. Although most thunderstorm outflow winds range from 30 to 50 mph, on occasion these winds can exceed 100 mph. Downburst-producing storms often give little advance indications of the imminent danger on weather radar or to the spotter, so warnings are difficult to issue.



Severe thunderstorm winds (60 mph or stronger) often cause flying debris, perhaps even in a swirling or rotating motion, but that does not mean the damage was caused by a tornado. Flying debris and significant damage can occur with severe thunderstorms. Take severe thunderstorm warnings seriously!

To be safe from strong thunderstorm winds, go inside a sturdy building but stay away from windows that could break. If available, get to a basement or underground shelter. Large hail and flooding rains may accompany strong winds, so be alert to these dangers. Stay informed about the weather at all times!



# Sirens Are An Outdoor Warning System

Every year the National Weather Service and the Emergency Management communities get together and provide severe weather information for the public. Every year we emphasize the fact that the Outdoor Sirens are just that...an Outdoor Warning System. Every year we get a multitude of calls telling us that the sirens can't be heard while in the house.

Severe weather season usually begins in the early spring in Kansas. We all need to be prepared for severe weather at any time of the day or night and at any time of year. The National Weather Service, Emergency Management, Law Enforcement, the 9-1-1 Center, and the Fire Department cannot notify every individual of the possibility of severe weather in their town. The local media outlets and All Hazards NOAA Weather Radio are your best sources for information concerning severe weather watches and warnings. Do not wait for the sirens to be your warning system at home, sirens may not be working if the power is out and oftentimes cannot be heard indoors. Sirens may not be activated for other severe threats such as damaging straight line winds in excess of 60 mph, large hail and flooding. Monitor NOAA Weather Radio and local media and then take the appropriate action for the severe weather threat. If it appears that a severe thunderstorm is approaching your location, do not wait for the outdoor sirens, take immediate action to protect your life and the lives of others in your home.



Hundreds of volunteer storm spotters, amateur radio operators, and first responders put their lives on the line every time there is severe weather in the local area. They do this because they care about the people in their communities and want to make sure those people are given the best chance at survival. The storm spotters, emergency managers, law enforcement and other volunteers immediately relay severe weather reports to the National Weather Service. The National Weather Service in turn disseminates that information to the media and public through warnings, statements and local storm reports. Getting the word out to the public in a timely manner may save lives. When severe weather threatens at night, when most people are sleeping, it can be especially dangerous. Oftentimes, in the heat of the spring and summer, we cannot

hear outdoor sirens over running air conditioners. A NOAA Weather Radio with a back-up battery can make the difference for you and your family.

Take responsibility...listen to the media....take protective action....survive to enjoy the wonderful warm sunny days that also come this time of year.